

[0016] Furthermore, directional information associated with at least one subband of the plurality of subbands associated with the left and the right signal representation is provided, the directional information being at least partially indicative of a direction of a sound source with respect to the left and right audio channel. For instance, the at least one subband of the plurality of subbands may represent a subset of subbands of the plurality of subbands or may represent the plurality of subbands associated with the left and the right signal representation.

[0017] As an example, the directional information associated with the at least one subband may represent any information which can be used to generate a spatial audio signal subband representation associated with a subband of the at least one subband based on the left signal representation, on the right signal representation, and on the directional information associated with the respective subband.

[0018] For instance, the directional information may be indicative of the direction of a dominant sound source relative to the first and second microphone for a respective subband of the at least one subband of the plurality of subbands.

[0019] Furthermore, the method according to a first exemplary embodiment of the first aspect of the invention may comprise determining an encoded representation of the left signal representation, of the right signal representation, and of the directional information. Thus, the encoded representation may comprise an encoded left signal representation of the left signal representation, an encoded right signal representation of the right signal representation, and an encoded directional information of the directional information.

[0020] Thus, as an example, the encoded representation may be transmitted via a channel to a corresponding decoder, wherein the decoder may be configured to decode the encoded representation and to determine a spatial audio signal representation based on the encoded representation, i.e. based on the left and right signal representation and based on the directional information. For instance, exemplary embodiments of such a decoder will be explained with respect to the second aspect of the invention.

[0021] Furthermore, since the right signal representation is associated with the right audio signal and since the left signal representation is associated with the left audio signal, it is possible to generate or obtain a Left/Right-stereo representation of audio based on the left and right signal representation. Thus, although the encoded representation may be used for determining a spatial audio representation, this encoded representation is completely backwards compatible, i.e. it is possible to generate or obtain a Left/Right-stereo representation of audio based on the encoded representation.

[0022] According to an exemplary embodiment of all aspects of the invention, said left audio channel is captured by a first microphone and said right audio channel is captured by a second microphone of two or more microphones arranged in a predetermined geometric configuration.

[0023] A first microphone is configured to capture a first audio signal. For instance, the first microphone may be configured to capture the left audio channel. Furthermore, a second microphone is configured to capture a second audio signal. For instance, the second microphone may be configured to capture the right audio channel. The first microphone and the second microphone are positioned at different locations.

[0024] For instance, the first microphone and the second microphone may represent two microphones of two or more microphones, wherein said two or more microphones are

arranged in a predetermined geometric configuration. As an example, the two or more microphones may represent omnidirectional microphones, i.e. the two or more microphones are configured to capture sound events from all directions, but any other type of well suited microphones may be used as well.

[0025] Furthermore, as an example, an example a microphone arrangement may comprises an optional third microphone which is configured to capture a third audio signal. For instance, in this example of a microphone arrangement, the three or more microphones are arranged in a predetermined geometric configuration having an exemplary shape of a triangle with vertices separated by distance d , wherein the three microphones are arranged on a plane in accordance with the geometric configuration. It has to be understood different microphone setups and geometric configurations may be used. For instance, the optional third microphone may be used to obtain further information regarding the direction of the sound source with respect to the two or more microphones arranged in a predetermined geometric configuration.

[0026] According to an exemplary embodiment of all aspects of the invention, the directional information is indicative of the direction of the sound source relative to the first and second microphone for a respective subband of the at least one subband of the plurality of subbands associated with the left and the right signal representation.

[0027] According to an exemplary embodiment of all aspects of the invention, the directional information comprises an angle representative of arriving sound relative to the first and second microphones for a respective subband of the at least one subband of the plurality of subbands associated with the first and the second signal representation.

[0028] For instance, the directional information may comprise an angle α_b representative of arriving sound relative to the first microphone and second microphone for a respective subband b of the at least one subband of the plurality of subbands associated with the left and right signal representation. As an example, the angle α_b may represent the incoming angle α_b with respect to one microphone of the two or more microphones, but due to the predetermined geometric configuration of the at least two microphone, this incoming angle α_b can be considered to represent an angle α_b indicative of the sound source relative to the first and second microphone for a respective subband b .

[0029] As an example, the directional information may be determined by means of a directional analysis based on the left and right signal representation.

[0030] For instance, the directional analysis may be performed for each subband of at least one subband of the plurality of subband in order to determine the respective directional information associated with a respective subband of the at least one subband.

[0031] As an example, a plurality of subband components of the left signal representation and of the right signal representation are obtained. For instance, the subband components may be in the time-domain or in the frequency domain. In the sequel, it may be assumed without any limitation the subband components are in the frequency domain.

[0032] For instance, a subband component of a k th signal representation may denoted as $X_k^b(n)$. As an example, the k th signal representation in the frequency domain may be divided into B subbands

$$X_k^b(n) = x_k(n_b + n), n=0, K, n_{b+1}-n_b-1, b=0, K, B-1, \quad (1)$$